

**WE CLAIM:**

1           1.     A method of connection establishment in a short-range wireless communication  
2 environment, comprising:

3           a)     generating a RF-ID interrogation signal by a first terminal equipped with a RF-ID  
4 tag reader device;

5           b)     detecting the RF-ID interrogation signal by a second terminal equipped with  
6 means to detect and respond to RF-ID interrogation signals when within the range of the RF-ID  
7 interrogation signal;

8           c)     notifying a processor in the second terminal of the presence of the RF-ID  
9 interrogation signal for setting a short-range communication module in the second terminal into a  
10 predefined operation mode for being capable of detecting paging signals directed to the second  
11 terminal;

12          d)     responding to the RF-ID interrogation signal by transmitting a RF-ID response  
13 signal to the first terminal including identification information relating to the short-range  
14 communication module of the second terminal;

15          e)     processing the received RF-ID response signal by the first terminal to activate a  
16 short-range communication module in the first terminal to initiate a shortened session setup by  
17 transmitting a short-range paging signal directed to the second terminal based on information of  
18 the received RF-ID response signal to establish a short-range connection with the second  
19 terminal; and

20           f)       detecting the paging signal by the short-range communication module in the  
21 second terminal for immediate establishment of a short-range connection between the first and  
22 second terminals.

1           2.       The method of Claim 1 further comprising:

2           g)       incorporating in the second mobile terminal a RF-ID tag reader having tag  
3 functionality and terminal identification information.

1           3.       The method of Claim 2 further comprising:

2           h)       switching the RF-ID tag reader in the second terminal to operate in a show  
3 communication mode and simulate a RF-ID tag device.

1           4.       The method of Claim 1 wherein the first and second terminals include RF-ID tag  
2 readers operating in an active mode.

1           5.       The method of Claim 1 wherein the RF-ID tag reader of the second terminal  
2 operates in a powered down state and passive mode.

1           6.     The method of Claim 4 wherein one RF-ID tag reader automatically switches to a  
2     passive state when de-energized.

1           7.     The method of Claim 1 wherein the short-range communication modules of the  
2     first and the second terminals conform to the principles of Bluetooth technology.

1           8.     The method of Claim 7 wherein the processor of the second terminal responding  
2     terminal to the second terminal informs the Bluetooth module of the second terminal to enter into  
3     a Bluetooth page scan mode after detecting an interrogation signal and responding to it with  
4     identification information of the Bluetooth communication module in order to provide a  
5     shortened device discovery and session setup between the terminals.

1           9.     The method of Claim 7 wherein transmitting the paging signal by the first  
2     terminal comprises transmitting by the first terminal a Bluetooth paging message to the second  
3     terminal including the Bluetooth identification information of the short-range communication  
4     module of the second terminal.

1           10.    The method of claim 7, wherein the predefined operation mode of the second  
2     terminal is Bluetooth Page scanning mode.

1           11.     The method of Claim 7, wherein the identification information relating to the  
2     short-range communication module of the second terminal includes at least a unique Bluetooth  
3     identification number of the short-range communication module of the second terminal.

1           12.     The method of Claim 1, further comprising:

2           i)     periodically updating at least portion of the identification information relating to  
3     the second terminal.

1           13.     The method of Claim 12, wherein the identification information relating to the  
2     short-range communication module of the second terminal includes a Bluetooth serial number  
3     and Bluetooth Clock Offset information of the short-range communication module of the second  
4     terminal.

1           14.     The method of Claim 1, wherein one of the terminals is a stationary access point  
2     connected to an infrastructure network enabling the other terminal to conduct transactions with  
3     service applications within the communication network through the established wireless short  
4     range connection.

1           15.     The method of Claim 14, wherein the infrastructure network is the Internet.

1           16.     The method of Claim 1, wherein the first and the second terminals are mobile  
2 terminals.

1           17.     The method of Claim 16 further comprising:

2           j)     determining whether a short-range connection is acceptable.

1           18.     The method of Claim 17 further comprising:

2           k)     instructing the short-range communication module to enter into a page scanning  
3 mode if the Bluetooth mode is acceptable.

1           19.     Method of Claim 17 further comprising:

2           l)     instructing the short-range communication module to enter into a non-  
3 connectable connection if the Bluetooth mode is not acceptable.

20. Apparatus for connection establishment in a short-range wireless communication environment, comprising:

a) means for generating a RF-ID interrogation signal by a first terminal equipped with a RF-ID tag reader device;

b) means for detecting the RF-ID interrogation signal by a second terminal equipped with means to detect and respond to RF-ID interrogation signals when within the range of the RF-ID interrogation signal;

c) means for notifying a processor in the second terminal of the presence of the RF-ID interrogation signal for setting a short-range communication module in the second terminal into a predefined operation mode for being capable of detecting paging signals directed to the second terminal;

d) means in the second terminal for responding to the RF-ID interrogation signal by transmitting a RF-ID response signal to the first terminal including identification information relating to the short-range communication module of the second terminal;

e) means in the first terminal processing the RF-ID response signal to activate a short-range transceiver in the first transceiver to initiate a shortened session setup by transmitting a short-range paging signal to the second terminal based on information of the received RF-ID response signal to establish a short-range connection with the second terminal;  
and

20           f)       means in the second terminal for detecting the paging signal by the short-range  
21   communication module for immediate establishment of a short-range connection between the  
22   first and second terminals.

1           21.     The Apparatus of Claim 20 wherein the second mobile terminal is a RF-ID tag  
2   reader having tag functionality and terminal identification information

1           22.     The Apparatus of Claim 20 further comprising:

2           g)       means for switching the RF-ID tag reader in the second terminal to operate in a  
3   show communication mode and simulate a RF-ID tag device.

1           23.     The Apparatus of Claim 20 wherein the first and second terminals include RF-ID  
2   tag readers operating in an active mode.

1           24.     The Apparatus of Claim 20 wherein the RF-Tag reader of the second terminal  
2   operates in a powered down state and passive mode.

1           25.     The Apparatus of Claim 24 wherein one RF-Tag reader automatically switches to  
2     passive state when de-energized.

1           26.     The Apparatus of Claim 20 wherein the short-range communication modules of  
2     the first and second terminals conform to the principles of Bluetooth technology.

1           27.     The Apparatus of Claim 26 wherein the processor of the first terminal responding  
2     terminal to the second terminal informs the Bluetooth module of the first terminal to enter into a  
3     Bluetooth page scan mode after detecting an interrogation signal and responding to it with a  
4     Bluetooth communication module identification information in order to provide a shortened  
5     device discovery and session setup between the terminals.

1           28.     The Apparatus of Claim 26 wherein transmitting the paging signal by the first  
2     terminal comprises transmitting by the first terminal a Bluetooth paging message to the second  
3     terminal including the Bluetooth identification information of the short-range communication  
4     module of the second terminal.

1           29.     The Apparatus of claim 26, wherein the predefined operation mode of the second  
2     terminal is Bluetooth Page scanning mode.



1           30.     The Apparatus of Claim 26, wherein the identification information relating to the  
2     short-range communication module of the second terminal includes at least a unique Bluetooth  
3     identification number of the short-range communication module of the second terminal.

1           31.     The Apparatus of Claim 20, further comprising:

2           h)     means periodically updating at least portion of the identification information  
3     relating to the second terminal.

1           32.     The Apparatus of Claim 31, wherein the identification information relating to the  
2     short-range communication module of the second terminal includes a Bluetooth serial number  
3     and Bluetooth Clock Offset information of the short-range communication module of the second  
4     terminal.

1           33.     The Apparatus of Claim 20, wherein one of the terminals is a stationary access  
2     point connected to an infrastructure network enabling the other terminal to conduct transactions  
3     with service applications within the communication network through the established wireless  
4     short range connection.

1           34.     The Apparatus of Claim 33 wherein the infrastructure network is the Internet.

1           35.     The Apparatus of Claim 20, wherein the first and the second terminals are mobile  
2 terminals.

1           36.     The Apparatus of Claim 20 further comprising:

2           i)     determining means determining whether a short-range connection is acceptable.

1           37.     The Apparatus of Claim 36 further comprising:

2           j)     instructing means instructing the short-range communication module to enter into  
3 a page scanning mode if the Bluetooth mode is acceptable.

1           38.     The apparatus of Claim 37 wherein the instructing means instructs the short-range  
2 communication module to enter into a non-connectable connection if the Bluetooth mode is not  
3 acceptable

1           39.     The Apparatus of Claim 20 wherein the RF-ID tag reader comprises:  
2           k)     a radio frequency interface and an antenna; and  
3           l)     an associated logic unit, which is connectable to the radio frequency, interface  
4     where the associated logic unit is operable in a transponder operation mode, in which the reader  
5     device acts as radio frequency identification transponder.

1           40.     The Reader device according to Claim 20 which comprises a reader logic unit,  
2     which is connected to said radio frequency interface and which allows for operating said reader  
3     operation mode.

1           41.     The Reader device according to Claim 40, wherein said transponder operation  
2     mode is operable independently from any power supply.

1           42.     The Reader device according to Claim 20 or Claim 21 wherein said reader device  
2     is adapted to operate as a passive radio frequency identification transponder in said transponder  
3     operation mode.

1           43.     The Reader device according to Claim 40, wherein said reader device acts as a  
2     passive read-only radio frequency identification transponder in said transponder operation mode.

1           44.     The Reader device according to Claim 40, wherein said transponder logic unit  
2     comprises a transponder memory.

1           45.     The Reader device according to Claim 44 wherein said transponder memory is  
2     non-volatile.

1           46.     The Reader device according to Claim 45 wherein said transponder memory is  
2     configurable.

1           47.     The Reader device according to Claim 40, wherein said transponder logic unit is  
2     coupled through a switch unit to said radio frequency interface, wherein said switch unit is  
3     operable to select between said reader operation mode and said transponder operation mode.

1           48.     The Reader device according to Claim 40 wherein said reader device operates  
2     autonomously in said transponder operation mode during periods of time, within which said  
3     reader device is not energized.

1           49.     The Reader device according to Claim 40, wherein said radio frequency interface  
2     is adapted to provide signals required for operation of said reader device in said reader operation  
3     mode and said transponder operation mode.

1           50.     The Reader device according to Claim 40, wherein said reader device supports  
2     near field communication (ECMA-340) standard, wherein said reader device is operable with a  
3     passive communication mode in said reader operation mode, wherein said reader device is  
4     operable with a show communication mode in said transponder operation mode.

1           51.     The Reader device according to Claim 40 wherein said reader device is operable  
2     with an active communication mode in said reader operation mode.

1           52.     A portable electronic device, which is, connected to a reader device for radio  
2 frequency identification transponders, wherein said reader device comprises:

3           a)     a radio frequency interface and an antenna such that said reader device is  
4 adapted to communicate at least with said radio frequency identification transponders in a reader  
5 operation mode; and

6           b)     an associated transponder logic unit which is connectable to said radio frequency  
7 interface, wherein said transponder logic unit (is operable in a transponder operation mode, in  
8 which said reader device acts as a radio frequency identification transponder.

1           53.     The portable terminal according to Claim 52, wherein said reader device is a  
2 reader device according to Claim 39.

1           54.     The portable terminal according to Claim 52, wherein said portable electronic  
2 device is enabled to communicate via a public land mobile network.

1           55.     A system including a portable electronic device and a reader device for radio  
2 frequency identification transponders, which is connected to said portable electronic device,  
3 wherein said reader device comprises:

4           a)     a radio frequency interface and an antenna such that said reader device is  
5 adapted to communicate at least with said radio frequency identification transponders in a reader  
6 operation mode; and

7           b)     a transponder logic unit, which is connected /to, said radio frequency interface,  
8 wherein said transponder logic unit is operable in a transponder operation mode, in which said  
9 reader device acts as a radio frequency identification transponder.